



# NASA Advisory Council

## Human Exploration and Operations Committee

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Human Exploration & Operations Mission Directorate



Status Report:  
SLPS NAC Subcommittee  
CASIS

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- A large image of the International Space Station (ISS) in orbit above Earth. The station's complex structure, including multiple modules and large solar panel arrays, is clearly visible against the blue and white horizon of the planet. In the top left corner, there is a small inset image of Earth from space. In the top right corner, there is a small inset image of an astronaut in a white spacesuit floating in space next to a large, reddish-brown planet (Mars) and a smaller, dark, cratered planet (Mars' moon, Phobos).
- **NASA's Space Life and Physical Sciences Research and Applications Division (SLPS) has been formulated to execute high quality, high value research and application activities in the areas of:**
    - Space Biology
    - Physical Sciences
    - Human Research
  - **These programs conduct fundamental and applied research to advance basic knowledge and to support human exploration in the environment of space.**
  - **Division serves as they agency liaison with the ISS National Laboratory management organization (CASIS)**

## Executive Branch and Congressional Direction for a Nonprofit Management Entity

The President's FY-11 Budget request included specific direction to NASA to establish an independent research management organization for the U.S. share of ISS utilization capacity. This direction was consistent with findings and recommendations contained in the November 2009 GAO report on "ISS: Significant Challenges May Limit Onboard Research." Many studies have been conducted over the past decade by NASA and others regarding approaches to managing U.S. utilization of the ISS.

Section 504 of the NASA Authorization Act of 2010 extended ISS operations to 2020 and directed NASA to maximize the value of the investment of the U.S. government has made in the ISS and demonstrate the scientific and technological productivity of the ISS over the next decade. It directed NASA to enter into a Cooperative Agreement with an independent nonprofit organization with 501(c)(3) status to support research and development and to manage the activities of the ISS National Laboratory.



## Selection of CASIS to manage the ISS National Laboratory

NASA released a Cooperative Agreement Notice (CAN) on February 14, 2011 for a non-profit entity “to develop the capability to implement research and development projects utilizing the ISS National Laboratory.” The objectives stated in the CAN included:

*Identify the unique capabilities of the ISS that provide breakthrough opportunities for non-NASA uses*

*Identify and prioritize the most promising research pathways*

*Increase the utilization of the ISS and facilitate matching of research pathways with funding sources*

In April, 2011, four proposals were received in response to the CAN. CASIS was awarded a Cooperative Agreement on August 31, 2011. The Agreement has a planned value of \$15M/ year, with a period of performance ending in September, 2020.



## CASIS Startup Activities

CASIS began with an interim Board of Directors comprised of the executive management of Space Florida, the sponsoring organization for the CASIS proposal

Frank DiBello (chair)  
Howard Haug  
Denise Swanson

The original Executive Director was Dr. Jeanne Becker, who also served as an acting Chief Scientist. She resigned on March 5, 2012, citing differences with the Board. Jim Royston, originally Director of Strategy, Planning, and Operations, was named as the acting Executive Director

In 2012, the Interim Chief Scientist, Timothy Yeatman, MD, working with an interim Science Advisory Board, reviewed published results from life sciences research on the ISS and identified initial CASIS research priorities in protein crystal growth and non-embryonic stem cell culture. Three proposals were selected for protein crystal growth research, through an open solicitation and peer review.

## Current CASIS Board of Directors

The current CASIS Board was appointed in November, 2012. Under Florida state law, it is self-perpetuating – the board is responsible for selecting its successors.



Dr. France Córdova is the chair of the CASIS Board. She is President Emerita of Purdue University. Previous positions include Chancellor of UC Riverside and NASA Chief Scientist. She is also currently serving as the chair of the board of directors of the Smithsonian Institution.



Dr. Bess Dawson-Hughes, M.D., serves as a Professor of Medicine at Tufts University, and as the Director of the Bone Metabolism Laboratory at Tufts. She is a member of the national medical honor society, Alpha Omega Alpha. She has served on the Advisory Council of the National Institute of Arthritis, Musculoskeletal, and Skin Diseases, was President of the National Osteoporosis Foundation, and is currently Vice President of the International Osteoporosis Foundation.

## Current CASIS Board of Directors



Dr. Lewis Duncan currently serves as the president of Rollins College. Previous positions include Dean of the Thayer School of Engineering at Dartmouth University and Head of Earth and Space Sciences at Los Alamos National Laboratory. Dr. Duncan is recognized for his work in space plasma physics and radar studies of the upper atmosphere.



Dr. Leroy M. Hood, MD, is a pioneer in the systems approach to biology and medicine. His professional career began at Caltech, where he and his colleagues developed the DNA sequencer and synthesizer and protein synthesizer and sequencer. He has played a role in founding over 14 companies, including Amgen and Applied Biosystems. He is a member of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. In 2012 he was awarded the National Medal of Science.



Dr. Andrei Ruckenstein is Vice President and Associate Provost for Research at Boston University. He has held faculty positions at UC San Diego and Rutgers University, and has served as President of the Aspen Center for Physics. He was the co-founder of the Aspen Science Center.

## Current CASIS Board of Directors



Dr. Gordana Vunjak-Novakovic serves as the Mikati Foundation Professor of Biomedical Engineering and Medical Sciences at Columbia University, and is the director of the Laboratory for Stem Cells and Tissue Engineering at Columbia. She is a fellow of the American Institute for Medical and Biological Engineering and of the Biomedical Engineering Society, and a member of the National Academy of Engineering.



Dr. Howard Zucker serves as Professor of Clinical Anesthesiology at Albert Einstein College of Medicine, as Adjunct Professor of Law at Georgetown University, and as a senior advisor in the Division of Global Health and Human Rights at Massachusetts General Hospital. He has served as Assistant Director-General of the World Health Organization, and U.S. Deputy Assistant Secretary of Health focused on science, technology, and medicine.

**Current Board top priority is hiring a new permanent Executive Director. The Board is also developing its strategy and mission concept for CASIS**

**CASIS has completed two solicitations, selecting proposals in protein crystal growth and materials science.**

**The CASIS Science Advisory Board is currently examining the potential for Earth Observation and non-embryonic stem cell culture aboard the ISS.**



## Research Subcommittee of the HEO Committee

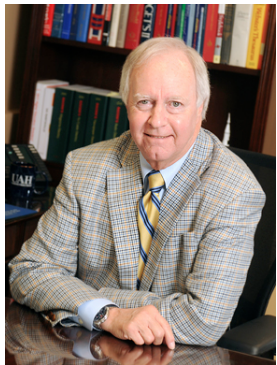
- **NASA Advisory Council Recommendation in March, 2012 to create a subcommittee that “...advises NASA on the research and educational needs that are required to support a plan for the long-range human exploration of space. The subcommittee should include a breadth of perspectives that encompass research and higher educational needs, not representation of specific disciplines.”**



## HEOC Research Subcommittee



Dr. David Longnecker, M.D., is the chair of the subcommittee. He is a member of the Human Exploration and Operations Committee. He is a Director of the Association of American Medical Colleges, and is the Robert D. Dripps Professor Emeritus of Anesthesiology and Critical Care at the University of Pennsylvania. He has served as President of the American Board of Anesthesiology, and is a member of the Institute of Medicine. At the IOM, he has served as chair of the Standing Committee on Aerospace Medicine and the Medicine of Extreme Environments

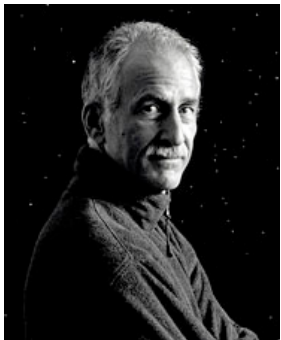


Dr. Robert A. Altenkirch currently serves as president of The University of Alabama in Huntsville. Prior to this appointment, he served as president of New Jersey Institute of Technology. Dr. Altenkirch earned his B.S. from Purdue University, an M.S. from the University of California, Berkeley, and his Ph.D. from Purdue. Other previous positions include vice president for research at Mississippi State University and dean of the College of Engineering and Architecture at Washington State University

## HEOC Research Subcommittee



Dr. M. Katherine Banks is the Dean of Engineering at Texas A&M University. Previously she had been head of the School of Civil Engineering at Purdue University. At Purdue, she also served as director of the EPA Hazardous Substance Research Center. She is a Fellow of the American Society of Civil Engineers and served as editor-in-chief for the *ASCE Journal of Environmental Engineering* and associate editor of the *International Journal of Phytoremediation*.



Dr. Jeffrey A. Hoffman is a Professor of the Practice in the Department of Aeronautics and Astronautics at the Massachusetts Institute of Technology. At MIT he also directs the Massachusetts Space Grant Consortium. He served as the NASA Europe Representative, and flew on five Shuttle missions as a NASA astronaut. Before joining the astronaut corps, he worked as an astrophysicist, with a focus on gamma ray and x-ray astronomy.

## HEOC Research Subcommittee



Dr. Terri L. Lomax serves as the Vice Chancellor for Research, Innovation and Economic Development at North Carolina State University. Previous positions include Deputy Associate Administrator for Research in the Exploration Systems Mission Directorate, and Director of the NASA Fundamental Space Biology Division. She was a member of the faculty at Oregon State University from 1987 until 2006, with research interests in plant physiology and genetics.



Dr. Stein Sture is Vice Chancellor for Research at the University of Colorado, Boulder. He also is the Huber and Helen Croft Endowed Professor in the Department of Civil, Environmental, and Architectural Engineering in the College of Engineering and Applied Science. He has been a faculty member at CU Boulder since 1980. His fields of expertise are in the areas of experimental and analytical modeling in solid mechanics, geomechanics, computational geotechnics, and geotechnical engineering.

## HEOC Research Subcommittee



Dr. Kathryn C. Thornton is a Professor at the University of Virginia in the School of Engineering and Applied Science in the Department of Mechanical and Aerospace Engineering. She served from 1999 until 2012 as the Assistant Dean and later Associate Dean for Graduate Programs. Selected as an astronaut candidate by NASA in May 1984, Thornton is a veteran of four space flights. Since leaving NASA, Thornton has served on several review committees and task groups, including the National Research Council Study: Science Opportunities Enabled by Constellation (2007) as co-chair.





## HEOC Research Subcommittee

**The NAC recommendation looks for a group that “...advises NASA on the research and educational needs that are required to support a plan for the long-range human exploration of space.” Some natural questions for discussion:**

- **How do we insure the highest level of quality science utilization on the ISS?**
- **What part should research (beyond planetary science) play in human space exploration?**
- **What role should the academic enterprise play in a robust, long-term vision of human space exploration?**
- **When the ISS ends in 2020 or 2028, what place should life and physical sciences (and engineering and medicine) have in the foundation of human space flight?**





# Questions?

